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| January issue,   | 100,300 copies. |
| February issue,  | 100,225 "       |
| March issue,     | 100,500 "       |
| April issue,     | 100,450 "       |
| May issue,       | 100,300 "       |
| This issue is    | 100,475 "       |

# THE AMERICAN FARMER

Established 1819.

WASHINGTON, D. C., JUNE, 1895.

76th Year. New Series.—No. 70.

## POCKET GOPHERS.

### Underground Vermin Which Do Immense Damage.

By VERNON BAILEY.

(Condensed from Bulletin No. 8, United States Department of Agriculture.)

#### INTRODUCTION.

The name "Gopher" is applied to these animals throughout the greater part of the region they inhabit, though in the Southern States they are commonly called "salamanders." Since the real salamanders are lizard-like animals, once believed to live in fire, it seems probable, as suggested by Dr. Goode, that the name was given to the gophers from the sudden appearance of their fresh mounds on ground recently blackened by fire. In the Mississippi Valley the name gopher is used for the ground squirrels as well as the pocket gophers,

continuous efforts toward their destruction. They remain in their fields working havoc among crops, killing his choicest trees, eating the roots from garden vegetables, and destroying meadows and fields of grain. They breed and multiply beneath his very feet, and work as silently and unobserved as the frost, while the result of their work is shown above their tunnels by lines of withering and dying plants.

There is another side to the question, and the gophers should be given full credit for the important part they have played in mixing and enriching soils. Still, the verdict must go against them. We must protect our crops.

There is no demand for legislation or for any concerted action. The bounty system has been repeatedly tried and has always proved a failure and a waste of the funds of the County or State, as shown beyond. There is little difficulty in destroying the gophers on a farm, and once reduced their numbers may be easily controlled.

accustomed route. When carrying food to one of his storerooms he rarely turned around, but usually ran backward to the place of deposit, returning for more, and repeating the operation again and again, the to-and-fro movement suggesting a shuttle on its track.

In all pocket gophers the tail is rather large and fleshy, and as a rule is naked or scantily haired. Its function had long been a puzzle, but the gopher above mentioned used it as an organ of touch when running backward. The tail is doubtless endowed with special sensibility, and is evidently of great value in warning the animals of the presence of an enemy in the rear when they are traveling backward in their dark tunnels.

#### BURROWS.

Gopher burrows seem to have neither beginning nor end. They are extended and added to year after year, and in many cases those dug by a single animal would measure a mile or more if straightened out. I have never attempted to ascertain the actual length of one, but feel secure in making the above statement. At the end of a year a gopher may often be found within 20 rods of the point from which he started, but in traveling this distance he has paid no attention to the points of the compass. He follows a tender root for a few feet, then moves to one side, encounters a stone, and makes a second turn. A layer of mellow soil entices him off in another direction, and so on through a thousand devious crooks and turns. Sometimes the main passage swings around and crosses itself, or numerous side branches are extended varying distances. The main tunnel usually runs from six inches to a foot below the surface. At intervals varying from a few feet to a few rods openings are made through which to discharge the earth that makes the little piles called "gopher hills." The openings are closed by being packed so full of dirt that no trace of the runway is visible except the little mounds that mark its course. An average-sized gopher hill contains five or six quarts of earth, but the quantity varies from a pint to a bushel. They are generally circular and a foot or more in diameter. The quantity of dirt in each varies greatly with different kinds of soil and according to the distance between the hills. In mellow soil both holes and hills are larger than in hard soil. I once counted the hills thrown out by three gophers (*Geomys bursarius*) 12 days after a rain. The numbers were, respectively, 28, 35, and 40. As the gophers work all summer, and to some extent through the winter, the total quantity of earth brought to the surface and the total area covered are considerable. For example, in the central part of Minnesota, where the ground is unfrozen for seven months in the year, the lowest number in the three cases mentioned, 28 hills in 12 days, would result in 490 hills in seven months, or at least 500 square feet of ground covered over with subsoil in one year by one gopher.

#### MIXING THE SOIL.

That gophers have done great good in preparing the land for cultivation cannot be denied. For unknown ages they have been steadily at work plowing the ground, covering deeper and deeper the vegetable matter, loosening the soil, draining the land, and slowly but surely cultivating and enriching it. On the prairies that are swept each year by fire, the only vegetation remaining to decay and fertilize the soil is that which the gopher hills cover and protect from the flames. On poor, sandy soil the scant vegetation would dry up, blow away, and only a small amount find its way into the soil, were not the gophers busy all summer burying the fresh plants. Carefully scrape away a gopher hill that has been standing for six months, and a layer of decayed plants will be found under it. In a year or two new plants will spring up on the spot, and draw their nourishment from the elements of former growth, these again in time to be buried and add their substance to the wealth of the soil. Hence it would be well to examine their habits carefully before condemning the gophers that occupy wild pastures and idle land.

#### HIBERNATION.

Although gophers are supposed to hibernate, there is abundant evidence that they do not. While all hibernating animals become very fat in Autumn, as a preparation for their long winter's fast, gophers never undergo such a change. Moreover, during snowy winters when the ground is not frozen they continue their work under the snow. When the snow is light, hills may be thrown up under it in the ordinary way, but if it becomes too hard to be readily pushed aside, the animals excavate tunnels in it into which they push the earth. As the snow disappears in Spring, cylinders of packed earth are frequently seen

radiating from the closed ends of gopher holes. They are sometimes 20 feet long. Throughout the northern part of the gopher country the ground usually remains frozen during most of the winter. Then the gophers do not appear at the surface at all, but are probably extending their tunnels below the frost, where food is obtained from the deep running roots. To what extent they depend on the stores laid up in Fall is hard to tell. Part of the supply is sometimes used, but frequently the Spring plowing turns out an untouched and moldy store left from the preceding year. Of course, the supply of food encountered in extending their tunnels determines whether the stores shall be drawn upon.

#### FOOD.

The food consists chiefly of roots, tubers, and other rather hard vegetable substances, though grass and the succulent parts of plants are sometimes eaten. In agricultural districts the animals are highly injurious, destroying potatoes and

sufficiently tame to eat freely from the hand, and was commonly fed bits of potato, of which he was particularly fond. The manner of eating was peculiar and interesting, and showed an ability to use the huge forefoot and claws in a way previously unsuspected. After satisfying the immediate demands of hunger it was his practice to fill one or both cheek pouches. His motions were so swift that it was exceedingly difficult to follow them with sufficient exactness to see just how the operation was performed. If a whole potato was given him, or a piece too large to go into the pouch, he invariably grasped it between the forepaws and proceeded to pry off a small piece with the long lower incisors. He would then raise himself slightly on his hind legs and hold the fragment between his forepaws while eating, for he usually ate a certain quantity before putting any into the pouches. If small pieces were given him he took them promptly and passed them quickly into the pouches. Some pieces were thus disposed of at once; others were first trimmed by biting off projecting angles. As a rule one pouch was filled at a time, though not always, and the hand of the same side was used to push the food in. The usual course is as follows: A piece of potato, root, or other food is seized between the incisor teeth, and is immediately transferred to the forepaws, which are held in a horizontal position, the tips of

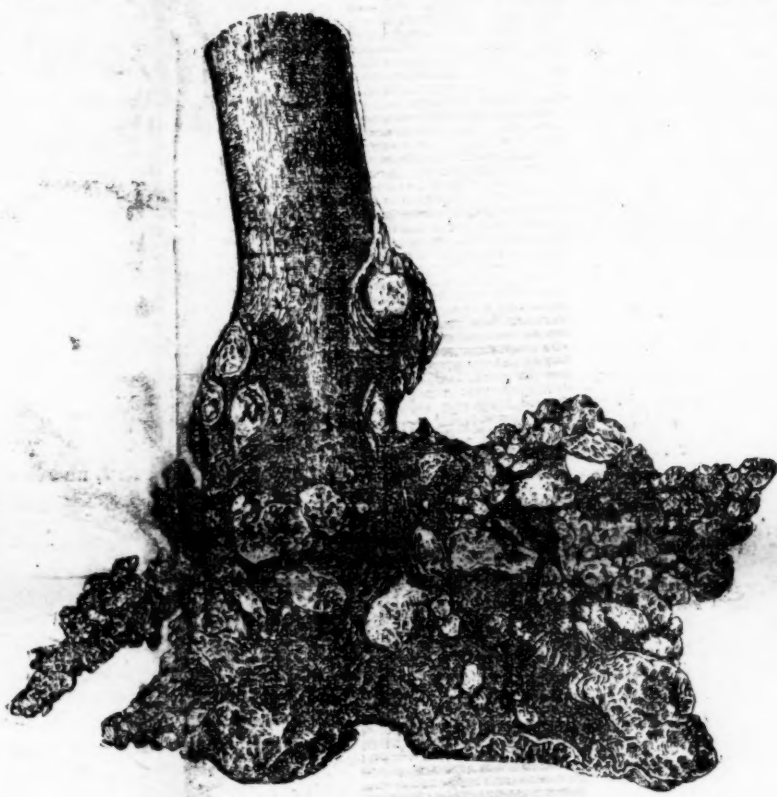


Fig. 3.—Root of apple-tree gnawed off by Pocket Gopher.

other tubers in large quantities, and gnawing off the roots of fruit trees. When a burrow strikes the roots of a tree it is carried around among them until one after another the smaller ones are cut off and eaten and the bark stripped from the larger ones, so that the tree is almost invariably killed. If the tree is not large, every root is sometimes cut off, and the first breeze tips it over.

#### DRINK.

So far as known, pocket gophers do not drink. Like other rodents of arid regions, they obtain the necessary water from the plants on which they feed. Persons who have kept gophers in confinement—Dr. Goode, Dr. Merriam, Prof. Herrick, and Mr. J. B. Parvin—have never been able to make them drink.

#### USE OF POUCHES.

Though their eyes are small and their range of vision limited, the gophers lose little thereby in the dark underground passages. Touch, taste, and smell take the place of sight as guides in selecting the roots with which they are constantly coming in contact while excavating their endless tunnels. They have broad, chisel-like teeth for cutting these roots, and large, fur-lined pockets in their cheeks in which to carry their food. Under cover of overhanging vegetation they fill these pouches with green leaves and stems to carry back and eat at leisure in their holes. In half a minute enough food for a good meal may be collected and stowed away, while a much longer time would be required to eat the same where collected. This arrangement is especially important to the gophers from the fact that their sight is not keen. Probably their vision is better at night, or at least during the twilight, for then they are most active.

Chipmunks, squirrels, and ground-squirrels take food in their mouths, and with the tongue push it out between the teeth into an elastic pouch, just as boys put marbles in their cheeks. In the squirrels and chipmunks the cheek-pouches communicate with the mouth. In the pocket gopher (also in all species of pocket mice and kangaroo rats) the pouches open from the outside along the front of the cheeks. They extend back under the skin to the shoulders, are lined with short hair, and are enveloped by muscles. The way in which gophers fill their cheek-pouches is thus described by Dr. Merriam in the technical paper already referred to:

A live *Geomys* from Vernon, Tex., has been carefully observed for the purpose of ascertaining how the reserve food is placed in the cheek pouches. The animal soon became

## BUDDING.

### When It Should Be Done, and How to Do It.

(Report of Washington State Board of Horticulture.)

On growing trees in the orchard budding should be done during August or early September. It can also be done in May if the buds were selected the previous winter and kept in a cool, moist place.

The process of changing a tree of inferior variety into one bearing fruit of superior value is simple, and should be undertaken without hesitation by any careful orchardist who may possess such property. It is best if the trees are not over five years old, but budding can be successfully performed on older trees by selecting smooth places on the bark of limbs as low down as possible.

Budding consists in separating a bud with a portion of bark attached from a shoot of the current season's growth of one tree and inserting under the bark of another. When this bud begins to grow, all that part of the stock above it is cut away, the bud grows on and eventually forms a tree of the same variety as that from which it was taken.

#### NECESSARY CONDITIONS.

The buds must be perfectly developed in the axils of the leaves on the young shoots intended to bud from. This is seldom the case until the shoot has temporarily ceased to lengthen, as indicated by the perfect formation of its terminal bud. The maturity of buds may be hastened very much by pinching the tips of the shoots. In 10 or 12 days after the pinching of a very soft shoot its buds are fit for working. The bark must also raise freely from the stock to be budded. Trees that accomplish most of their growth early in the season must be watched and budded before they cease to grow; those that grow very late must not be budded early, or the formation of new wood may surround and cover the buds; in gardeners' language, they will be "drowned by the sap."

#### IMPLEMENTS NEEDED.

Any person who can whittle, or who has mechanical ingenuity enough about him to use a good, sharp knife, can bud. A pruning knife and a budding knife are needed. The former to remove any branches that may be in the way of inserting the bud; the latter to take off the buds and make incisions in the stock, and this should have a very thin, smooth and keen edge. If the work to be done is only small in amount, the different blades of a good pocket knife may be sharpened to serve the purpose.

Strings for tying in the buds are generally either taken from bass mats or they are prepared from the bark of the basswood. For a limited number the fibrous, paper-like inner bark of willow, cedar or other forest trees can be made to answer the purpose, or if nothing else at hand even cotton string, though for any extensive work the basswood bark should be used.

#### PREPARING AND PRESERVING THE BUDS.

Young shoots from which buds are to be taken are cut below the lowest plump bud, but near the base where the buds are quite small they should not be taken. The leaves are then stripped off, leaving half of each leaf stock by which to handle the bud.

If a considerable quantity are cut at once they should be stripped of the

placed on the shoot half an inch above the bud to be removed (Fig. 6); the thumb of the knife hand rests on the shoot below the bud B; a drawing cut is then made parallel with the shoot, removing the bud and the bark to which it is attached half an inch above and three-quarters below it. This is the usual method, but it may in many cases be shorter. The cut is made just deep enough to be below the bark. A small portion of the wood is always taken off with it, and if this adheres firmly it should be allowed to remain; if it parts freely it should be taken out, but in doing so the root of the bud must be carefully

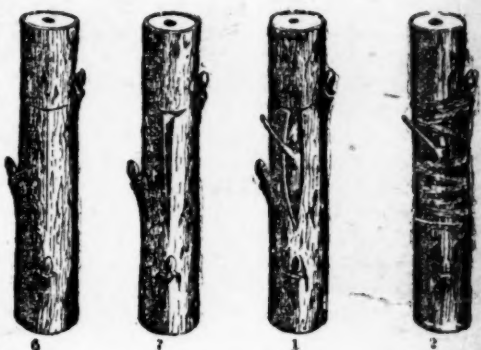


Fig. 6, a stock with the bark slit vertically and across; Fig. 7, the same with bark raised; Fig. 1, the same with bud inserted; Fig. 2, the same, tied up.

preserved, for if it comes out with the wood the bud is useless. The root of the bud, as it is termed, is a small portion of wood in the hollow part of the inside of the bud. Fig. 8 is a good bud; A, root of bud; B, root of leaf. Fig. 7 is imperfect, the roots of leaf and bud both out. A smooth place on the stock clear of branches is then chosen, where two incisions are made to the depth of the bark, one across the end of the other so as to form a T (Fig. 6); the bark on the two edges of the perpendicular cut is raised (Fig. 7) with the smooth ivory handle of the budding knife, or the back part of the knife blade used, and the bud is inserted between them (Fig. 1); the upper end of bark attached to the bud is cut square to fit to the horizontal cut on the stock. The bass string is then wound around tightly, beginning at the bottom and covering every part of the incision, leaving the bud itself and the leaf stock uncovered (Fig. 2), the string is fastened above the horizontal cut, and the work is done.

#### ESSENTIAL POINTS.

Smooth cuts and exact fit of the bud to the incision made are necessary; also make the tying secure and close, so as to exclude air and rain. The insertion of a bud should not in any case occupy more than a minute. Persons of practice will set from 120 to 200 buds per hour with help in tying. Better success is generally had with budding in dry weather than when damp, the sap being in a better condition to form a union between the stock and the bud. The chief difficulty experienced by beginners is the proper removal of the bud. When the knife passes exactly between the bark and wood the bud must be good; but there is generally more or less wood attached and the removal of this is a fine point. The cherries, peaches and apples are more easily budded on this account than the plum and pear, these having larger shoulders and are not so flat as the former. If there is a cavity between the bud and stock formed by taking away too much wood the bud will not grow. With a little practice success will easily be attained.

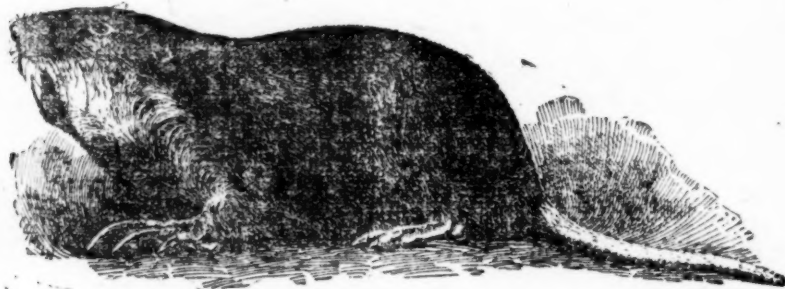
MIXED VARIETIES FOR POLLINATION. We find that several varieties of fruit trees which while they produce flowers with sufficient pollen are to some extent self sterile.

Where there are large blocks of a single variety of trees it may be necessary to insert some other variety of the same species at certain intervals, and this can easily be accomplished by the process of budding.

#### Manure for Light Land.

Stable manure is good for all kinds of soils, but for a light or a very heavy soil a compost of manure and swamp muck is better than the manure itself. Of the artificial manures, the mixture of several in different proportions has been found most useful for light land; as, for instance, 200 pounds of superphosphate of lime, 100 pounds of potash salts, and 50 pounds of nitrate of soda may be used per acre. An application of 20 bushels of freshly-burned lime, air-slacked by exposing it in small heaps to the weather for two or three weeks, is always useful. The fresh lime is dropped on the field in heaps of one bushel, two rods apart each way, and when it has fallen to a fine, dry powder it is scattered as evenly as possible with a long-handled shovel, so as to whiten the ground evenly all over. This makes the 20' bushels per acre.

Idaho is going extensively into sugar beets.



GEORGIA GOPHER, GEOMYS TUZA (Ord.)

#### GENERAL HABITS.

**Underground life.**—Even where gophers are so numerous as to be exceedingly troublesome, few people are familiar with them in life; they keep so close to their underground tunnels as to be rarely observed unless caught in traps. By patient watching a little brown head may sometimes be seen for an instant while the animal pushes a load of earth from a freshly-opened hole; but on rare occasions the whole animal appears above ground, but disappears again so quickly that the eye hardly catches its form. Still more rarely one may be met with following a road or path remote from its hole.

As pocket gophers spend their lives underground, their whole organization is modified in accordance with the needs of a subterranean existence. The different kinds, though numerous, are very much alike externally. They are short-legged, thick-set animals, without an appreciable neck, without noticeable external ears, and with very small eyes. The feet are largely developed for digging. The forepaws in particular are very strong, are armed with long curved claws, and the sides of the toes are lined with rows of bristles that evidently serve in preventing the dirt from passing between the fingers (Fig. 3), thus completing a more effective arrangement for keeping the tunnels clean, and for pushing the earth out of the openings in the burrows. The tail, which is of moderate length, is thick, fleshy, and usually devoid of hair, and is endowed with tactile sensibility.

The pocket gophers, in working their way through the earth in the construction of their tunnels, use the powerful upper front teeth as a pick to loosen the ground. At the same time the fore feet are kept in active operation, both in digging and pressing the earth back under the body, and the hind feet are used in moving it still farther backward.

When a sufficient quantity has accumulated behind the animal he immediately turns in the burrow and by bringing the wrists together under the chin, with the palms of the hands held vertically, forces himself along by the hind feet, pushing the earth out in front. When an opening in the tunnel is reached the earth is discharged through it, forming a little hillock that resembles in a general way the hills thrown up by moles. In many gophers there is a naked callosity or "nasal pad" over the anterior half of the nose, which must be of great assistance in the construction of the tunnels.

The substance of the following notes on the habits of a live gopher in captivity is from a technical paper recently published by Dr. C. Hart Merriam.

A pocket gopher from Vernon, Tex., ran backward as rapidly and easily as forward. This method of progression was particularly noticeable when the animal could follow a runway or other

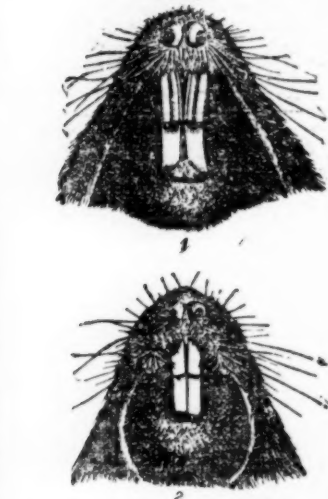


Fig. 1.—Face of *Geomys bursarius*, showing grooved upper incisors and opening of cheek pouches. Fig. 2.—Face of *Thomomys talpoides*, showing plain upper incisors and openings of cheek pouches.

color of the soil. What seems like fur is in reality soft, silky hair, with a smoothness and gloss that repels the dirt and keeps the animal bright and clean though in constant contact with the soil. Such beauty as they have lies in their perfect adaptation to a peculiar mode of life.

Pocket gophers belong among the rodents or gnawers. In general they may be recognized by their peculiar form, already described, and by the presence of cheek pouches opening outside of the mouth. The only other mammals having external cheek pouches are the pocket mice and kangaroo rats, which differ from the gophers in slender, graceful forms, long tails and long hind legs. The gophers may be subdivided into two groups, those with grooved front teeth, and those with smooth front teeth. (See Figs. 1 and 2.)

The harmfulness of these animals is perhaps best shown by the fact that single Counties have paid for their destruction in one year as much as \$14,000. That animals living below the surface of the soil, rarely seen and to most people unknown, can be the cause of enough mischief to bring such a price upon their heads may surprise many people. A careless observer might travel for weeks over the Western prairies and not be aware of their presence, and yet the buffalo and antelope in their past abundance were not one-tenth as numerous. Unlike larger animals, gophers do not disappear before man unless as the result of his direct and



Fig. 3.—Left forefoot of *Geomys personatus*, showing the rows of bristles which form brushes on the sides of the toes.





























Fancy Farming.



Newcomer—Say, I don't like to show my ignorance, but am not above taking a little advice. Is it best to plant your eggs in a hill or sow them in a row?

Farmer—What in thunder do you expect to raise?

Newcomer—Spring chickens.—Judge.

## Almost as Good.

A maiden lady in Kansas keeps a parrot, which swears and a monkey which chews tobacco. She says between the two she doesn't miss a husband very much.

## A Good Place to Learn.



"Can you swim, little boy?"

"Yes, sir."

"Where did you learn?"

"In the water, sir."—Texas Siftings.

## Suited to the Occasion.

Jeweler—These paste diamonds look just as beautiful as the real ones, but they only last a short time.

Young Man—Well, this engagement is only going to last a short time.—Harlem Life.

## A Political Turn.

Mayor's Secretary—You can't see the Mayor now; he's in his private office.

Seedy Politician—What right's he got to a private office? It wuz a public office we elected him to, wuzn't it? You tell him ter come right out quick, or I'm agin' him.—Roxbury Gazette.

## What a Baby Can Do.

Friend—I don't understand why you and your husband should have separated so soon.

Mrs. Aftermath—It was all owing to the baby's temper.

Friend—Mercy on us! How could that be?

Mrs. Aftermath—We couldn't agree as to which one of us the baby took after.—New York Weekly.

## The Power of the Eye.

It is told of Van Amburgh, the great lion-tamer, that on one occasion he was asked how he gained his wonderful power over animals. He said:

"It is by showing them that I am not in the least afraid of them, and by keeping my eye steadily on theirs. I'll give you an example of the power of my eye."

Pointing to a lionish fellow that was sitting near by he said:

"You see that fellow? He's a regular clown. I'll make him come across the room to me, and I won't say a word to him." Sitting down, he fixed his keen, steady eye on the man. Presently the fellow, straightened himself up, rose from his seat and came across to the lion-tamer. When he was close enough he drew back his arm and struck Van Amburgh a tremendous blow over the chin, knocking him clean over the chair, with the remark: "You'll stare at me like that again, won't you?"—Tid-Bits.

## A Besetting Sin.

A reverend gentleman was once on a time sitting across the street from a chapel of colored people in Jacksonville, Fla., and heard the following unique and original exposition, by the preacher, of the parable of the rich man and Lazarus:

"An' now, brethern, an' especially you, sisters, why do ye spose de rich man wanted de water on de tip of he tongue only, and not all ober de hull body? I will tell yer. Mind, now, and specially ye sisters—because de sins ob de tongue are so much wuss dan de ob de body, dat he tongue burned so much mo' dan de rest ob him, dat he forget ebbering else in its fire. Ah, sisters, tink ob de words dat are running off yo tongue continually and look out for de tip of fire in de nex' world." The good pastor who overheard states that the comment was good; but the special application to "de sisters" was thrilling.

## Georgia Style.

"My friend, how long have you lived in this neighborhood?"

"Sence de big hick'ry was a saplin'."

"What is your age?"

"Well, I wuz born when Old Jim Dobbs's mill wuz built."

"You don't answer me clearly. Have you no method of computing time?"

"Oh, yes! When you see de shadders ob them trees straight in de road, it's 12 o'clock, or it ain't far off!"—Atlanta Constitution.

## THE CHILDREN'S SCRAPBOOK

DEAR CHILDREN: Here is a letter expressly to you. Do you keep a scrapbook? If not, you must get some thick manilla paper, fold it so you will have large, square pages, fasten them with a darning needle and shoe thread, and stitch or paste on a cover of brown backing, which most book stores keep, or any kind of strong pasteboard you can find. If you cannot do all this yourself, get a big brother or sister to do it for you. Write on the outside of the cover as plainly and as neatly as possible:

## SCRAP BOOK.

## THE PROPERTY OF TOMMY TRADDLES,

or Nellie Gray, or whatever your name is. You will find hereafter little poems, recitations and sketches which are intended to go in your book. Of course you can take clippings from other papers too, but always remember this: Never use up valuable space by pasting in anything that is not worth keeping, and that you do not like very much. At the end of the year you will have a story book the like of which could not be bought in the best book store in the world. Have a particular place to keep your book, so it will not get torn or soiled when you are not using it, and when it is begun write a letter and tell the editor all about it. Your true friend—EDITOR SCRAP BOOK.

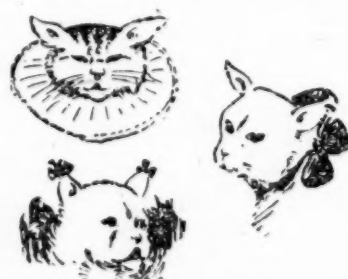
## A Puzzled Professor.

I understand most languages that human beings speak—French, German, Spanish, English, with Latin, Dutch and Greek; But I have a very little boy that's wiser far than I. For he's puzzled me completely by a very strange reply. A circus came to town one day, and Tommy longed to go. He asked me for permission, and I simply answered no. His chin turned up, his mouth turned down, he stamped and clutched his hand, and uttered the queer sentence that I couldn't understand: "I don't—ah, ooh—boo, ah! Papa! You might, you never—boo!" "Ur, hur! er—let me go, ah yah! to any—Oh! Boo—boo!" At least it sounded so to me; and what I'd like to know is whether some obliging boy his cleverness will show. By sending me in English what Tommy meant to say. That time that he addressed me in that very foreign way.

## A CAT SHOW.

Something the Children Enjoyed in New York.

There was a great show in the big city of New York about a month ago. It was a cat show held at the Madison Square Garden. Almost everybody who owned a pretty or an ugly cat sent it down to be put in a cage and looked at by crowds of children and grown-up people who came to the show. The cat that most everybody liked best is named



## ULTRA FASHIONABLES.

Grover Cleveland, and they gave him the prize of a blue ribbon. He is brown, with wide, black stripes, and took his naps on a white satin cushion. Other cats were named Tammany, Chappie, and Whiskers. The cage that the children liked best was where a beautiful puss named Mittens stayed with six canaries and a parrot without trying to jump for them at all. The picture shows three of the prettiest kittens.

## A Little Queen.

Here is a pretty story about Wilhelmien, and next month we will have a pretty picture of her. She is not a little queen out of a fairy tale, but a real, live girl, and Queen of the country of Holland.

One day her mother had to scold her, and left her alone to think over her naughtiness. After awhile she knocked at her sweet mother's door.

"Who is there?" was asked. "Her Majesty, the Queen of Holland, wishes to enter," said the haughty, naughty maiden.

"She cannot come in," was the answer.

"Mamma, it is your penitent, wicked Wilhelmien who wants to ask you to forgive, she said with a good many tears, and her mother, just like any mother, said: "Open the door, dear."

## THE DAIRY.

## Skimmings.

Oleomargarine in New Hampshire is colored pink.

Iowa has a net increase of 17 creameries during the past year.

Vermont has made great progress in the matter of butter making and has found it profitable.

A good cow is always an economical feeder, but she has no power to manufacture something out of nothing. A poor cow, however, can make nothing out of something without any great effort.

Mr. Dawley, of Unionville, N. Y. says: When we sell a ton of butter, we remove from the soil but 48 cents' worth of fertility, mostly nitrogen. A ton of milk sold removes \$280. This would be about \$28 of fertility removed in the milk required to produce a ton of butter.

One must use judgment in feeding cotton-seed meal. It is a concentrated food, and if too much of it is fed the cows are liable to become diseased. Use it judiciously and in connection with some other foods. It is highly nitrogenous, and should be fed with corn meal, timothy hay, or other like foods.

New York State has heretofore and is now a large producer of both butter and cheese, but is seriously feeling the competition of the West. The State is fast filling up with manufacturing industries, and farm lands are advancing, and to-day are higher in value than in New England. There is no doubt but what she will decrease her make of both butter and cheese as time wears on.

## Ensilage Not a Complete Food.

Ensilage alone is not an economical food, as it is deficient in the starchy matter, and has so much water in it that a cow must eat 100 pounds of it to get enough nutriment to live upon. For in 100 pounds of it there are only 22 pounds of dry matter, of which one-fourth is not digestible. The digestible matter has about two pounds of protein, or matters that go to make flesh; six pounds of carbonaceous matters, that go to support the animal heat, and not quite half a pound of fat, while an animal of 1,000 pounds must have fully two and a half pounds of the first, 12½ pounds of the second, and nearly half a pound of fat. Thus the ensilage is deficient in the heat-forming substances, and it will need some addition of starchy matter, such as middlings, to complete it. But 100 pounds of food of any one kind, except it be of the best pasture grasses, is too much, and especially of ensilage, which is by no means desirable for the sole nutriment of an animal. Thus it is better to give one-half this quantity, or 50 pounds, or even 40 of it, and make up the rest of dry fodder, such as clover hay, with sufficient grain food to make the even ration. With 40 pounds of ensilage and 10 of hay, adding four pounds of cornmeal and the same of bran, or the equivalent of any of the oil-meals or the gluten meals for these, will make a full ration for any cow giving a pound of butter a day.

## Grain for Cows.

Prof. Robinson, of Ontario, is reported as saying that no cow should be fed more than eight pounds of grain a day. If the digestive organs of the cow are strained, she is injured permanently. I have visited several stables in Orange County recently, and in every one I detected a smell that showed plainly to me that the cows were being fed too much grain. It had passed undigested and had fermented. One should watch the droppings to see if the grain is all being digested. Very many dollars are lost by overfeeding. One cow pays for her food in the milk pail; another one turns her food into fat. One cow will eat, digest and assimilate a certain amount of grain; another will not, while another will eat and pay for more. Individuality of the animal must be studied by the feeder in order to rationally feed a herd of dairy cows. All these conditions must be considered when answering the question, just as the price of milk is considered. The manual value of a food must also be considered in calculating the worth of a food for the dairy cow.

I believe every farmer should feed his cows some grain during the Summer. Not only will he gain the advantage of the cows coming themselves to the stable at milking time without the use of a dog, but they will be in much better condition for Fall.

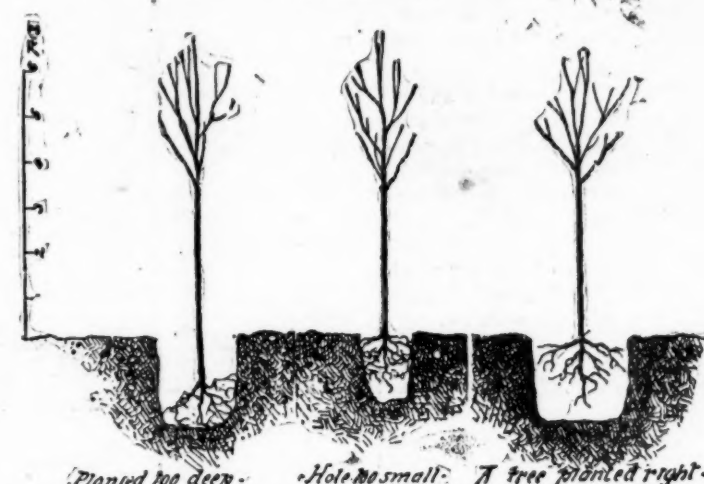
## A Young Calf That Will Not Drink.

Calves appear stupid and willful sometimes, but in the majority of cases it is the person who is trying to feed them that should be blamed for the same failing. The young things are led by instinct to suck the cow and to hold up the head for this purpose, and to teach them the reverse calls for patience and kindness. Doubtless some are more stubborn than others, but the right way will be successful with the worst of them in a short time. If the calf does not understand its business at first, the milk should be poured into its mouth by the scooped hand until it finds it is getting its food, then by gently pressing its head down to the milk in the pail, raised for the purpose as high as may be, and putting the two forefingers, spread a little apart, into its mouth, the calf will soon begin to drink. If it does not, the best way is not to try to force it, or beat it, but to leave it until it is hungry, when it will very quickly find a way to get the milk. Many times a calf a day or less old will drink at the first attempt, when its head is gently pressed down to the milk, fresh and warm from the cow. It is worth while to take this trouble, for when it is once over, a lot of unpleasant work is avoided in the future.

## Salting Butter at the Pennsylvania Station.

In three separate trials the churning was separated into three equal portions, one portion being salted at the rate of one ounce per pound, another at the rate of one and a half ounces per pound, and the third not salted. In one case only one-half ounce of salt was used instead of one and a half ounces. In two of the churnings a fourth portion was salted in the churn by the use of a strong brine. The separate lots of butter were all worked as nearly alike as possible, and samples were taken for the determination of water, fat, and salt. The butter salted with one-half ounce of salt contained 11.7 per cent. of water; that salted with one ounce averaged 9.84 per cent; with one and a half ounces, 9.68 per cent; salted with brine, 12.09 per cent; and unsalted, 13.31 per cent. "The amount of salt retained in the butter varied in these trials from 1.35 to 6.02 per cent, and seems to be dependent upon the amount of salt added." When the butter was salted with brine "practically none of the salt was retained. Salting by this method seems to be labor and salt thrown away."

## Setting Trees.



## Steer Feeding at the Utah Station.

Three lots of four steers each were fed alike on mixed hay from Nov. 29 to Dec. 20. From then until April 11 lot 7 had mixed hay alone; lot 8, hay with straw, alfalfa, or clover; and three pounds grain per head for one month; and lot 9 had hay and three pounds grain (bran, wheat and barley) per head daily. In the finishing period, April 11 to May 16, all received alike three pounds of grain (bran and wheat) per head, 10 pounds roots, three pounds straw, hay ad libitum. The steers were kept in yards with open sheds. The gains in weight, food eaten, and financial results are tabulated. From Nov. 29 to April 11, lot 7 (mixed hay) gained 574 pounds in all; lot 8, 270 pounds, and lot 9 (hay and grain), 252 pounds. During the final period lot 7 gained 99 pounds; lot 8, 11 pounds, and lot 9, 91 pounds. For the whole trial the average cost of food per pound of gain was 7.2 cents for lot 7, 10.71 cents for lot 8, and 8.51 cents for lot 9. With steers at two and a half cents per pound there was a loss with all the steers, which was least with lot 9.

## Care of the Cow.

The milking of a cow depends on the good management of the animal at the time of milking. As this approaches, the feed is to be reduced, so far as the grain ration is concerned. A due allowance of bran may still be given, as this is helpful rather than otherwise, but all stimulating foods, as cottonseed meal and others rich in protein, should be suspended for the time and for two weeks after the birth of the calf. Some dairy experts recommend a dose of cooling laxative medicine, as a pound of opson salts, which is doubtless useful if the condition of the cow needs any such reducing. It is better, however, to give these laxative agents in the form of food, thus exerting their influence healthfully without disturbing the ordinary action of the system. Thus, bran mash with some linseed meal added will keep the system cool and open and aid considerably in the safe delivery of the cow.

## Treatment for Garget.

The very common disease of the udder in cows, generally known as caked bag, is due to inflammation, the result of various causes, as by over-feeding with too rich and stimulating food, exposure to cold, or by irregular milkings, by which the udder is gorged at times, and thus the inflammation is produced. The symptoms are a stoppage of the milk, a hardness of one or more of the quarters of the udder, and the discharge of a thick, stringy matter when the teats are milked. The disease causes the milk in the udder to become clotted, so that it cannot be drawn off. To remedy this, some solution of common bicarbonate of soda (baking powder) is injected into the diseased part of the udder with a small syringe; this dissolves the clotted milk, which is then milked out, when the udder is then fomented with hot water and gently kneaded until it becomes soft, when it is wiped dry and well rubbed with the open hand and some camphorated soap liniment or preparation of ammonia. The food should be cooling and laxative, such as linseed and bran mash, and a pound of opson salts may be given in oatmeal gruel with benefit.

## MONEY FOR EVERYONE!

I can't understand why people complain of hard times when any woman or man can make from \$5 to \$10 a day easily. All have heard of the wonderful success of the Climax Dish Washer; yet we are apt to think we can't make money selling it; but anyone can make money, because every family wants one. I made \$47.35 in the last three months after paying all expenses, and attended to my regular business besides. You don't have to canvass; as soon as people know you have it for sale they send for a Dish Washer. Address the Climax Mfg. Co., Columbus, Ohio, for particulars. Go to work at once, and you will very soon have a full pocket book and a light heart. I think it a duty to inform each other of such opportunities, and I also think it a duty to improve them while we may. Try it at once and publish your experience so others may be benefited.

## THE ORCHARD.

## Cullings.

Orchards are being planted less with crops of grain as the years go by, it being evident that the soil needs enriching rather than to be reduced in fertility.

If your orchard trees have grown to such a size as to make it difficult to cultivate or as to shade the ground too much, do not hesitate to cut down every other tree.

The Beeman Sweet is a local apple of Ohio, and said to be far better than Talman Sweet. Mr. L. B. Pierce states that in his vicinity it is called Richard Sweet, and it is good, too.

While many fruit trees will give fair results without pruning, grape vines must be pruned every Spring. You are more likely not to cut away enough than to cut away too much of the grape vine. Be sure to leave three buds on each new shoot, for it is the new wood that furnishes grapes.

A paper read before the Nebraska Horticultural Society says that for horticultural purposes only 11 of the 35 or

40 known species of grape need be considered. These are *Vitis labrusca*, *V. californica*, *V. rotundifolia*, *V. vulpina*, *V. rotundifolia*, *V. vulpina*, and *V. rotundifolia*.

The amount of water evaporated by a good-sized apple tree, having 25,000 feet of evaporating surface, is estimated by Prof. Burrill, of the University of Illinois, to be about 31,200 ounces (about 250 gallons) per day. All this amount must be absorbed from the soil by the roots. It shows the magnitude of the water reservoir which we have in our soil.

To prevent potato eyes from shooting, one of the chief obstacles in preserving the vegetable, M. Schraiban, of the French Institut Agronomie, treats them with a two per cent. solution of sulphuric acid. The potatoes are kept in this for 12 hours and then dried; this kills the power of germination and the acid used can do no harm, as it does not penetrate the skin, and the amount is less than that contained in seltzer water.

The editor of *Gardening* has had excellent results with dwarf pear trees, and recommends them without hesitation to his readers. They are very useful in small gardens and to plant in borders in large ones. Pear trees, both dwarf and standard, love good ground, if a little inclined to clay so much the better, though any fair garden soil will suit them. But they must not be crowded, even if dwarfs; nine or 10 feet apart is close enough.

If you find galls on the canes of raspberries and blackberries, cut the infected canes and burn them without delay. Prof. S. B. Green says: "The galls frequently extend clear around, make the canes double their usual size, and cause a lingering death before the fruit ripens. The next Spring a grub is found in the swelling, which later develops into the water-beetle, that lays its eggs in the early Summer on the canes. These eggs hatch, and the young larvae working into the cane check the flow of sap, thus causing the galls. The canes should be destroyed before the larvae leaves the canes in Spring."

Concerning roots of orchard trees, it is advisable, in the North, to cut away only those roots which are broken or badly torn. These should be cut off just back of the injury. It is the custom to cut off the ends of all roots of the size of a lead pencil or larger, for a clean, smooth wound is supposed to heal quicker than a ragged one. These cuts are made from within outwards, so that the wound is more or less slanting across the roots and so that it rests firmly upon the ground when the tree is set. When the tree is planted, all the roots should be straightened out to nearly or quite their normal position. If it is found that one or two roots run off to an inordinate length, they may be cut back to correspond with the main root system.

Never set a cherry orchard in low, wet land, as the trees will not thrive. Let all birds except the blue jay and English sparrow remain in the orchard; the others will eat a few cherries, but they will do quite as much good as harm.

The orchard should be cultivated until the middle of August, then let alone until just before freezing. To produce a good crop of cherries a good wood growth is necessary. Good cultivation is next to plenty of rain.

A Philadelphia company is making paving blocks of compressed hay. Hiram S. Maxim, the inventor, says that New Englanders are the best mechanics in the world, and that the French are the best mechanics in Europe.

Icebergs in the Atlantic sometimes last for 200 years.

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## Herbaceous Grafting.

An Illinois experimenter, E. L. Rautenberg, recently told to the Illinois Horticultural Society a way of grafting seedlings into old vines, which he has practiced successfully for years, and by which he secures fruit the third year after seed. This method is here illustrated. It is one of herbaceous grafting. The grafting is done after the buds have developed four or five leaves, and when the sap is flowing. He chooses the place where the graft is to be inserted, and tightly wraps a twine several times around the vine. This will, in a measure, prevent the flow of sap. Below the string a sloping cut is made

downward, and above it one sloping upward. The cuts are about one inch in length. The cion should have a natural bend. This is cut wedge-shaped at each end, and so that the cion is a little longer than the distance between the two cuts. In inserting the cion, the bark of the original vine and the cion must be brought into direct contact, and the cion held in place by a string bound around both cion and vine sufficiently tight to force the cion's ends into place. If this be well done, no tie will be required at the ends, but the joints should be covered with grafting wax. Soon the bud will begin to grow. All the growing shoots not belonging to the cion are gradually removed, and in the course of the Summer all the wood above the graft may be taken off. In the Fall, all the stock above the lower cut, and the part of the cion above the bud are to be removed.

and destroy them at once. strong paper around the tree at its base will keep out. If they are already in the them out with a flexible wire.

Continue thinning out any needed, especially among the apples, pears, etc.; by so fruit is produced, with super and the weight at least equal. fruits are much benefited by mulching of some sort. A material for strawberries is grass from the lawn, which around them. Irrigate their ing fruiting season.

FORMULA FOR PEACH CUPPER carbonate, five copper monia (26°), 3 pints; water. Recommended by Newton E. The solution is prepared as standard formula.

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